

Serial No. 09/234,518

REMARKS

Claims 1-12, 14-21, and 23-34 are pending. Claims 1-3, 5, 7, 8, 14-21, and 23 have been amended and claims 13 and 22 have been deleted.

Reconsideration of the application is respectfully requested for the following reasons.

The Examiner rejected claims 1, 4, 13, 22, and 28 under 35 USC § 102(e) for being anticipated by the Korpela patent. In the Office Action, the Examiner indicated that claims 2, 3, 5-12, 14-21, 23-27, and 29-34 would be considered allowable if re-written into independent form to include the features of their base and intervening claims. Claims 2, 3, 5, 7, 8, 14-21, and 23 have been re-written in this manner. As a result of these amendments, it is respectfully submitted that claims 2, 3, 5, 7-12, 14-21, and 23-27 are in allowable condition. Claims 13 and 22 have been deleted. Applicants traverse the rejection of the remaining claims for the following reasons.

Claim 28 recites a method of operating a communication protocol between a base station and a plurality of mobile terminals using medium access control sub-layers in a communication system. The medium access control sub-layers are respectively provided in the base station and mobile terminals. In addition to these features, claim 28 recites that each of the medium access control sub-layers is configured to selectively perform an initialization mode step, an idle mode step, and a radio resource allocation mode step in response to requests from upper layers thereof.

Serial No. 09/234,518

In order to anticipate claim 1, the Korpela patent must disclose every feature recited in that claim, either explicitly or inherently. *In re Schreiber*, 44 USPQ.2d 1429, 1431 (Fed. Cir. 1997).

The Korpela patent discloses a mobile terminal which communicates with up to three networks adhering to different operating standards. In the example provided, the terminal is transmits and receives signals from a GSM network, an evolved GSM network, and a B-ISDN network. This is accomplished using the protocol management processor shown in Fig. 6, which selects code from one of three files 151, 152, and 153 to be used in forming packets compatible with respective ones of the aforementioned networks.

Claim 28 is different from the Korpela patent in at least the following respects. First, claim 28 recites that medium access control sub-layers are respectively provided in the base station and mobile terminals. Each of the medium access control sub-layers is configured to selectively perform an initialization mode step, an idle mode step and a radio resource allocation mode step in response to requests from upper layers thereof. The Korpela patent does not disclose these features.

At column 7, lines 35-58, Korpela discloses that its protocol processor operates in "idle mode," wherein it detects network identification and type signals for each of the three standards mentioned above. When a user desires to send information, the processor selects one of the three networks which is considered to be the best for transmitting the information. The protocol code in an appropriate one of code files is then selected to perform the transmission.

While the Korpela terminal operates in a mode called idle mode, Korpela does not disclose operating in an initialization mode or in a radio resource allocation mode as recited in claim 28. Page 41 of Applicants' disclosure discusses operations performed in an exemplary radio resource allocation mode. During this mode, the MAC sub-layer requests the allocation of a radio resource (signal channel or traffic channel) to be used for registration of the position of an originating call. This mode of operation, therefore, signifies a radio channel for a point-to-point service between the mobile terminal and the base station, which includes a signal channel (SDDCH) and traffic channel (TCH). (An example of the steps performed in this mode are discussed beginning at page 42.) The Korpela patent does not disclose operating in a radio resource allocation mode or an initialization mode. It therefore logically follows that Korpela does not disclose a MAC sub-layer which selectively performs one of those modes. It also follows that Korpela does not operate in one of these selected modes in response to requests from upper layers, as is also recited in claim 28.

Because the Korpela patent does not disclose all the features of claim 28, it is respectfully submitted that Korpela cannot anticipate this claim. It is further submitted that the foregoing differences are sufficient to render claim 28 and its dependent claims non-obvious and thus patentable over Korpela.

Claim 1 recites a communication system which has a plurality of mobile terminals and a base station. Each of said mobile terminals and/or base station includes a medium access control sub-layer, upper layers of said medium access control sub-layer, and a lower layer of said medium access control sub-layer. The medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or lower layer in response to requests therefrom. In addition to these features, claim 1 recites that the basic functions include at least one of a random access control information transfer function, a control information transfer function, a user information transfer function, framing/deframing functions, segmentation/reassembly functions, functions of dividing a frame of a specific one of said upper layers into channels of said lower layer and vice versa, a cyclic redundancy check function, a function of detecting an error of a medium access control sub-layer frame, and a rate adaptation function of adjusting a number of bits suitably for a radio frame. The Korpela patent does not disclose these features.

Claim 1 further recites that the associated functions include at least one of a synchronization information control function, a system information control function, lower channel activation/deactivation functions, quality monitoring and reporting functions of, for maintenance of traffic channel quality, supporting power control, triggering a handover or reporting a channel condition upon traffic channel allocation, and a multi-bearer sequencing function of sequencing a multi-code. The Korpela patent does not disclose these features.

Serial No. 09/234,518

Based on the foregoing differences, it is respectfully submitted that claim 1 and dependent claim 4 are patentably distinguishable from the Korpela patent.

Reconsideration and withdrawal of all the rejections and objections made by the Examiner is hereby respectfully requested.

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and prompt allowance of the application is respectfully requested.

Should the Examiner believe that further amendments are necessary to place the application in condition for allowance, or if the Examiner believes that a personal interview would be advantageous in order to more expeditiously resolve any remaining issues, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

To the extent necessary, Applicants petition for an extension of time under 37 CFR § 1.136. Please charge any shortage in fees due in connection with this application, including extension of time fees, to Deposit Account No.16-0607 (Attorney Docket No. K-078) and credit

Serial No. 09/234,518

any excess fees to the same Deposit Account.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Daniel Y.J. Kim', is written over a horizontal line.

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Marked-Up Version of the Amended Claims

1. (Amended) A communication system which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or base station comprising:

a medium access control sub-layer;

upper layers of said medium access control sub-layer; and

a lower layer of said medium access control sub-layer,

wherein said medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or lower layer in response to requests therefrom,

wherein said basic functions include at least one of a random access control information transfer function, a control information transfer function, a user information transfer function, framing/deframing functions, segmentation/reassembly functions, functions of dividing a frame of a specific one of said upper layers into channels of said lower layer and vice versa, a cyclic redundancy check function, a function of detecting an error of a medium access control sub-layer frame, and a rate adaptation function of adjusting a number of bits suitably for a radio frame, and

wherein said associated functions include at least one of a synchronization information control function, a system information control function, lower channel activation/deactivation functions, quality monitoring and reporting functions of, for maintenance of traffic channel quality, supporting power control, triggering a handover or reporting a channel condition upon traffic channel allocation, and a multi-bearer sequencing function of sequencing a multi-code.

2. (Amended) A [The] communication system [as set forth in Claim 1,] which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or said base station, comprising:

a medium access control sub-layer;

upper layers of said medium access control sub-layer; and

a lower layer of said medium access control sub-layer,

wherein said medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or said lower layer in response to requests therefrom, and

wherein said basic functions [are] include:

a random access control information transfer function,

a control information transfer function,

a user information transfer function,

framing/deframing functions,

segmentation/reassembly functions,

functions of dividing a frame of a specific one of said upper layers into channels of said lower layer and vice versa,

a cyclic redundancy check function,

a function of detecting an error of a medium access control sub-layer frame, and

a rate adaptation function of adjusting a [the] number of bits suitably for a radio frame.

3. (Amended) A [The] communication system [as set forth in Claim 1,] which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or said base station, comprising:

a medium access control sub-layer;
upper layers of said medium access control sub-layer; and
a lower layer of said medium access control sub-layer,
wherein said medium access control sub-layer is configured to perform self-basic
functions in response to basic function execution requests or functions associated with said
upper layers or said lower layer in response to requests therefrom, and

wherein said associated functions [are] include:
a synchronization information control function;
a system information control function,
lower channel activation/deactivation functions,
quality monitoring and reporting functions of, for [the] maintenance of traffic
channel quality, supporting power control, triggering a handover or reporting a channel
condition upon traffic channel allocation, and
a multi-bearer sequencing function of sequencing a multi-code.

5. (Amended) A [The] communication system [as set forth in Claim 4,] which has
a plurality of mobile terminals and a base station, each of said mobile terminals and/or said base
station, comprising:

a medium access control sub-layer;
upper layers of said medium access control sub-layer; and
a lower layer of said medium access control sub-layer,
wherein said medium access control sub-layer is configured to perform self-basic
functions in response to basic function execution requests or functions associated with said
upper layers or said lower layer in response to requests therefrom,

wherein said medium access control sub-layer includes a common control channel group and a dedicated control channel group which have a logical type of channels, and

wherein said common control channel group includes:

a synchronization channel for transferring time information for system time and base information for identification of said base station;

a broadcasting control channel for broadcasting access parameter information for access to said base station by a corresponding one of said mobile terminals, adjacent cell information indicative of radio frequency information of an adjacent cell, and available frequency information; and

a common control channel for setting a stand alone dedicated control channel between said corresponding mobile terminal and said base station.

7. (Amended) A [The] communication system [as set forth in Claim 4,] which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or said base station, comprising:

a medium access control sub-layer;

upper layers of said medium access control sub-layer; and

a lower layer of said medium access control sub-layer,

wherein said medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or said lower layer in response to requests therefrom,

wherein said medium access control sub-layer includes a common control channel group and a dedicated control channel group which have a logical type of channels, and

wherein said dedicated control channel group includes:

a stand alone dedicated control channel formed between a corresponding one of said mobile terminals and said base station for transferring terminal association setup information and call setup information;

an associated control channel formed between said corresponding mobile terminal and said base station for transferring power control information and handover information; and

a traffic channel formed between said corresponding mobile terminal and said base station for transferring actual data.

8. (Amended) A [The] communication system [as set forth in Claim 1,] which has a plurality of mobile terminals and a base station, each of said mobile terminals and/or said base station, comprising:

a medium access control sub-layer;

upper layers of said medium access control sub-layer; and

a lower layer of said medium access control sub-layer,

wherein said medium access control sub-layer is configured to perform self-basic functions in response to basic function execution requests or functions associated with said upper layers or said lower layer in response to requests therefrom,

wherein said medium access control sub-layer includes:

first channel control means for transferring information for synchronization between an originating end and a terminating end, setting a stand alone dedicated control channel between said originating end and said terminating end and performing a cell setting operation between said originating end and said terminating end using the set control channel; and

second channel control means for providing a connection-oriented point-to-point service to an upper layer of said first channel control means and monitoring a [the] quality of a radio link formed between said originating end and said terminating end.

14. (Amended) A [The signal processing] method [as set forth in Claim 13, wherein said method comprises the step of] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a synchronization information of system information broadcasting control operation between said corresponding mobile terminal and said base station, said step of performing said broadcasting control operating including [the steps of]:

sending time information, system information and paging information from said base station to said corresponding mobile terminal if said broadcasting control operation between said corresponding mobile terminal and said base station is requested; and

receiving said time information, system information and paging information from said base station and transferring a synchronization request message or system information update requested message to said lower layer of said corresponding mobile terminal.

15. (Amended) A [The signal processing] method [as set forth in Claim 13, wherein said method comprises the step of] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a random access control operation between said corresponding mobile terminal and said base station, said step of performing said random access control operation including [the steps of]:

sending a radio resource request message from said corresponding mobile terminal to said base station if said random access control operation between said corresponding mobile terminal and said base station is requested;

sending a radio resource request acknowledge message from said base station to said corresponding mobile terminal;

sending a radio resource response message from said base station to said corresponding mobile terminal; and

transferring a radio resource response reception message to a specific one of said upper layers of said corresponding mobile terminal.

16. (Amended) A [The signal processing] method [as set forth in Claim 13, wherein said method comprises the step of] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a lower channel activation or deactivation control operation of said corresponding mobile terminal or base station, said step of performing said lower channel activation or deactivation control operation including [the steps of]:

transferring a communication path activation or deactivation request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said lower layer of said corresponding mobile terminal or base station if said lower channel activation or deactivation control operation of said corresponding mobile terminal or base station is requested;

allowing said lower layer to activate or deactivate a communication path in response to said communication path activation or deactivation request message from said specific upper layer; and

allowing said lower layer to transfer the activated or deactivated result to said specific upper layer.

17. (Amended) A [The signal processing] method [as set forth in Claim 13, wherein said method comprises the step of] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a cell condition or channel condition reporting operation of said corresponding mobile terminal, said step of performing said cell condition or channel condition reporting operation including [the steps of]:

sending a cell condition or channel condition measurement request message from said base station to said corresponding mobile terminal if said cell condition or channel condition reporting operation of said corresponding mobile terminal is requested;

transferring a cell condition or channel condition measurement command to said lower layer of said corresponding mobile terminal in response to said cell condition or channel condition measurement request message from said base station;

allowing said lower layer of said corresponding mobile terminal to measure a cell condition of said corresponding mobile terminal in response to said cell condition or channel condition measurement command; and

sending a [the] measured result of said cell condition or channel condition from said lower layer of said corresponding mobile terminal to said base station.

18. (Amended) A [The signal processing] method [as set forth in Claim 13, wherein said method comprises the step of] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a control information/user information request operation of said corresponding mobile terminal or base station, said step of performing said control information/user information request operating including [the step of]:

sending a control information/user information request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said base station or corresponding mobile terminal if control information and user information are requested by said specific upper layer of said corresponding mobile terminal or base station.

19. (Amended) A [The signal processing] method [as set forth in Claim 13, wherein said method comprises the step of] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said

base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a cipher control operation of said corresponding mobile terminal or base station, said step of performing a cipher control operation including [the steps of]:

transferring a cipher request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said lower layer of said corresponding mobile terminal or base station if said cipher control operation of said corresponding mobile terminal or base station is requested;

allowing said lower layer to perform a cipher operation in response to said cipher request message from said specific upper layer; and

transferring a [the] result of said cipher operation from said lower layer to said specific upper layer.

20. (Amended) A [The signal processing] method [as set forth in Claim 13, wherein said method comprises the step of] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a handover control operation of said corresponding mobile terminal or base station, said step of performing said handover control operation including [the steps of]:

transferring a handover command from a specific one of said upper layers of said corresponding mobile terminal or base station to said lower layer of said corresponding mobile terminal or base station if a handover operation of said corresponding mobile terminal or base station is requested;

allowing said lower layer to perform said handover operation in response to said handover command from said specific upper layer; and

transferring a [the] result of said handover operation from said lower layer to said specific upper layer.

21. (Amended) A [The signal processing] method [as set forth in Claim 13, wherein said method comprises the step of] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested; and

performing a communication path modification control operation between said corresponding mobile terminal and said base station, said step of performing said communication path modification control operation including [the steps of]:

transferring a communication path modification request message from a specific one of said upper layers of said corresponding mobile terminal or base station to said lower layer of said corresponding mobile terminal or base station if said communication path modification control operation between said corresponding mobile terminal and said base station is requested;

allowing said lower layer to modify a communication path in response to said communication path modification request message from said specific upper layer; and

transferring a [the] modified result from said lower layer to said specific upper layer.

23. (Amended) A [The signal processing] method [as set forth in Claim 22,] of processing signals using medium access control sub-layers in a communications system which has a plurality of mobile terminals and a base station, said medium access control sub-layers being respectively provided in said mobile terminals and base station, said method comprising:

performing, in each of said medium access control sub-layers, self-basic functions or functions associated with upper layers or a lower layer of said mobile terminals and/or said base station, said performing step being performed if signal processing operations of a corresponding one of said mobile terminals, of said base station, or between said corresponding mobile terminal and said base station are requested,

wherein each of said medium access control sub-layers is adapted to determine formats of data frames according to types of messages to be sent, and

wherein each of said medium access control sub-layers includes:

a forward access channel associated with a channel request acknowledge message and channel response message which are sent from said base station to said corresponding mobile terminal; and

Serial No. 09/234,518

a reverse access channel associated with a channel request message which is sent from said corresponding mobile terminal to said base station.